

METHOD FOR PATTERNING A LOW ACTIVATION ENERGY PHOTORESIST

ABSTRACT OF THE DISCLOSURE

Polymers containing an acetal or ketal linkage and their use in lithographic photoresist compositions, particularly in chemical amplification photoresists, are provided. The polymer is prepared from at least one first olefinic monomer containing an acetal or ketal linkage, the acid-catalyzed cleavage of which renders the polymer soluble in aqueous base; and at least one second olefinic monomer selected from (i) an olefinic monomer containing a pendant fluorinated hydroxyalkyl group R^H , (ii) an olefinic monomer containing a pendant fluorinated alkylsulfonamide group R^S , and (iii) combinations thereof. The acetal or ketal linkage may be contained within an acid-cleavable substituent R^{CL} in the first olefinic monomer. A method for using the photoresist compositions containing these polymers in preparing a patterned substrate is also provided in which the polymer is rendered soluble in aqueous base at a temperature of less than about 100°C by acid-catalyzed deprotection of pendent acetal- or ketal-protected carboxylic acid groups.